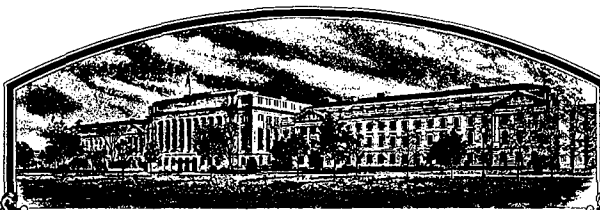


No.

9000250



# THE UNITED STATES OF AMERICA

TO ALL TO WHOM THESE PRESENTS SHALL COME:

**Pioneer Hi-Bred International, Inc.**

Whereas, THERE HAS BEEN PRESENTED TO THE

**Secretary of Agriculture**

AN APPLICATION REQUESTING A CERTIFICATE OF PROTECTION FOR AN ALLEGED NOVEL VARIETY OF SEXUALLY REPRODUCED PLANT, THE NAME AND DESCRIPTION OF WHICH ARE CONTAINED IN THE APPLICATION AND EXHIBITS, A COPY OF WHICH IS HEREUNTO ANNEXED AND MADE A PART HEREOF, AND THE VARIOUS REQUIREMENTS OF LAW IN SUCH CASES MADE AND PROVIDED HAVE BEEN COMPLIED WITH, AND THE TITLE THERETO IS, FROM THE RECORDS OF THE PLANT VARIETY PROTECTION OFFICE, IN THE APPLICANT(S) INDICATED IN THE SAID COPY, AND WHEREAS, UPON DUE EXAMINATION MADE, THE SAID APPLICANT(S) IS (ARE) ADJUDGED TO BE ENTITLED TO A CERTIFICATE OF PLANT VARIETY PROTECTION UNDER THE LAW.

NOW, THEREFORE, THIS CERTIFICATE OF PLANT VARIETY PROTECTION IS TO GRANT UNTO THE SAID APPLICANT(S) AND THE SUCCESSORS, HEIRS OR ASSIGNS OF THE SAID APPLICANT(S) FOR THE TERM OF *eighteen* YEARS FROM THE DATE OF THIS GRANT, SUBJECT TO THE PAYMENT OF THE REQUIRED FEES AND PERIODIC REPLENISHMENT OF VIABLE BASIC SEED OF THE VARIETY IN A PUBLIC REPOSITORY AS PROVIDED BY LAW, THE RIGHT TO EXCLUDE OTHERS FROM SELLING THE VARIETY, OR OFFERING IT FOR SALE, OR REPRODUCING IT, OR IMPORTING IT, OR EXPORTING IT, OR USING IT IN PRODUCING A HYBRID OR DIFFERENT VARIETY THEREFROM, TO THE EXTENT PROVIDED BY THE PLANT VARIETY PROTECTION ACT (AT. 1542, AS AMENDED, 7 U.S.C. 2321 ET SEQ.)

CORN

'PHP38'

In Testimony Whereof, I have hereunto set my hand and caused the seal of the Plant Variety Protection Office to be affixed at the City of Washington, D. C. this 30th day of August in the year of our Lord one thousand nine hundred and ninety-one.

Attest

*Kenneth H. Evans*  
Commissioner  
Plant Variety Protection Office  
Agricultural Marketing Service

*Ed Madigan*  
Secretary of Agriculture

U.S. DEPARTMENT OF AGRICULTURE  
AGRICULTURAL MARKETING SERVICE

**APPLICATION FOR PLANT VARIETY PROTECTION CERTIFICATE**  
(Instructions on reverse)

Application is required in order to determine if a plant variety protection certificate is to be issued (7 U.S.C. 2426). Information is held confidential (7 U.S.C. 2426).

1. NAME OF APPLICANT(S) (as it is to appear on the Certificate) Pioneer Hi-Bred International, Inc.		2. TEMPORARY DESIGNATION OR EXPERIMENTAL NO.	3. VARIETY NAME PHP38
4. ADDRESS (street and no. or R.F.D. no., city, state, and ZIP) Plant Breeding Division Department of Corn Breeding PO Box 85 Johnston, IA 50131-0085		5. PHONE (include area code) 515/270-3300	FOR OFFICIAL USE ONLY PVPO NUMBER 9000250
6. GENUS AND SPECIES NAME Zea mays	7. FAMILY NAME (Botanical) Gramineae		FILING Date August 28, 1990 Time <input type="checkbox"/> A.M. <input type="checkbox"/> P.M.
8. CROP KIND NAME (Common Name) Corn	9. DATE OF DETERMINATION March 1988		FILING Filing and Examination Fee: \$ 2150.00 Date August 28, 1990
10. IF THE APPLICANT NAMED IS NOT A "PERSON," GIVE FORM OF ORGANIZATION (Corporation, partnership, association, etc.) Corporation			CERTIFICATE Certificate Fee: \$ 250.00 Date July 26, 1991
11. IF INCORPORATED, GIVE STATE OF INCORPORATION Iowa	12. DATE OF INCORPORATION May 6, 1926		

13. NAME AND ADDRESS OF APPLICANT REPRESENTATIVE(S), IF ANY, TO SERVE IN THIS APPLICATION AND RECEIVE ALL PAPERS  
Dr. Bruce D. McBratney  
Plant Breeding Division  
Pioneer Hi-Bred International, Inc.  
PO Box 85  
Johnston, IA 50131-0085

PHONE (include area code): 515/270-3546

14. CHECK APPROPRIATE BOX FOR EACH ATTACHMENT SUBMITTED (Follow INSTRUCTIONS on reverse)

a. ☒ Exhibit A, Origin and Breeding History of the Variety.  
b. ☒ Exhibit B, Novelty Statement.  
c. ☒ Exhibit C, Objective Description of Variety.  
d. ☒ Exhibit D, Additional Description of Variety.  
e. ☒ Exhibit E, Statement of the Basis of Applicant's Ownership.  
f. ☒ Seed Sample (2,500 viable untreated seeds). Date Seed Sample mailed to Plant Variety Protection Office August 24, 1990  
g. ☒ Filing and Examination Fee (\$2,150) made payable to "Treasurer of the United States."

15. DOES THE APPLICANT(S) SPECIFY THAT SEED OF THIS VARIETY BE SOLD BY VARIETY NAME ONLY AS A CLASS OF CERTIFIED SEED? (See section 83(a) of the Plant Variety Protection Act.)  
☐ YES (If "YES," answer items 16 and 17 below) ☒ NO (If "NO," skip to item 18 below)

16. DOES THE APPLICANT(S) SPECIFY THAT THIS VARIETY BE LIMITED AS TO NUMBER OF GENERATIONS?  
☐ YES ☐ NO

17. IF "YES" TO ITEM 16, WHICH CLASSES OF PRODUCTION BEYOND BREEDER SEED?  
☐ FOUNDATION ☐ REGISTERED ☐ CERTIFIED

18. DID THE APPLICANT(S) PREVIOUSLY FILE FOR PROTECTION OF THE VARIETY IN THE U.S.?  
☐ YES (If "YES," through ☐ Plant Variety Protection Act ☐ Patent Act. Give date. \_\_\_\_\_)  
☒ NO

19. HAS THE VARIETY BEEN RELEASED, USED, OFFERED FOR SALE, OR MARKETING IN THE U.S. OR OTHER COUNTRIES?  
☐ YES (If "YES," give names of countries and dates)  
☒ NO

20. The applicant(s) declare(s) that a viable sample of basic seeds of this variety will be furnished with the application and will be replenished upon request in accordance with such regulations as may be applicable.

The undersigned applicant(s) is (are) the owner(s) of this sexually reproduced novel plant variety, and believe(s) that the variety is distinct, uniform, and stable as required in section 41, and is entitled to protection under the provisions of section 42 of the Plant Variety Protection Act.

Applicant(s) is (are) informed that false representation herein can jeopardize protection and result in penalties.

SIGNATURE OF APPLICANT (Owner(s)) Pioneer Hi-Bred International, Inc.	CAPACITY OR TITLE	DATE
SIGNATURE OF APPLICANT (Owner(s)) Bruce D. McBratney	Technical Support Coordinator	8/15/90 1

## 14A. Exhibit A. Origin and Breeding History

Pedigree: ~~PHG~~G39/PHK29)XZ3K3K2X

JMS  
7/10/91

Pioneer Line PHP38, Zea mays L., a yellow dent corn inbred, was developed by Pioneer Hi-Bred International, Inc. from the single cross ~~PHG~~G39 x PHK29 using the pedigree method of breeding. The progenitors of PHP38 are proprietary inbred lines of Pioneer Hi-Bred International, Inc. Selfing and selection were practiced within the above F1 cross for five generations in the development of PHP38 at Windfall, Indiana. During line development, crosses were made to inbred testers for the purpose of estimating the line's combining ability. Yield trials were grown at Windfall, Indiana, as well as other Pioneer research stations. After initial testing, additional hybrid combinations have been evaluated and subsequent generations of the line have been grown and hand-pollinated with observations made for uniformity.

PHP38 has shown uniformity and stability for all traits as described in Exhibit C - "Objective Description of Variety". It has been self-pollinated and ear-rowed a sufficient number of generations with careful attention paid to uniformity of plant type to assure genetic homozygosity and phenotypic stability. The line has been increased both by hand and in isolated fields with continued observations for uniformity.

No variant traits have been observed or are expected in PHP38.

## Developmental History for PHP38

<u>Season/Year</u>	<u>Inbreeding Level</u>
Summer 1983	F0 (Cross made)
Winter 1984	F1
Summer 1984	F2
Winter 1985	F3
Winter 1986	F4
Summer 1986	F5
Winter 1987	F6*
Summer 1987	F7
Winter 1988	F8
Summer 1988	F9
Winter 1989	F10
Summer 1989	F11**

\* PHP38 was selfed and selected through F6 generation.

\*\* PHP38 was selfed and ear-rowed from F7 through F11 generations.

**Exhibit A:** During the early development (F1-F2) of the inbreds, selection was based on agronomic characteristics (e.g., plant height, stalk lodging, disease and insect resistance, etc.) whereas, from F3 through later generations selection was based on yield as well as agronomic characteristics. The most important traits during selection would be those described in the definitions section and in Exhibit D. Yield is looked at on a per se basis and how well an inbred performs in hybrid combination.

## 14B. Exhibit B. Novelty Statement

JMS  
7/10/91

PHP38 is most similar to the Pioneer Hi-Bred International, Inc. proprietary inbred lines ~~PHG39~~ (PVP Certificate No. 8300115) and PHK29 (PVP Certificate No. 8700214). PHP38 sheds and silks approximately 75 (1469 versus 1544) and 82 (1484 versus 1566) growing degree units earlier than ~~PHG39~~ (Exhibit D). PHP38 has more marginal leaf waves (few versus none) and longitudinal leaf creases (many versus few) than ~~PHG39~~. PHP38 has red anthers compared to yellow anthers for ~~PHG39~~. PHP38 has 16 kernel rows whereas PHG39 has 12 rows. PHP38 has a light green fresh husk color, the fresh husk color of ~~PHG39~~ is dark green.

PHP38 has higher yield, similar moisture at harvest maturity, and higher test weight than ~~PHG39~~. PHP38 is shorter with lower ear placement than ~~PHG39~~. PHP38 has better resistance to stalk lodging than ~~PHG39~~.

PHP38 sheds and silks approximately 25 (1458 versus 1483) and 40 (1483 versus 1522) growing degree units earlier than PHK29 (Exhibit D). PHP38's leaf angle from the stalk is less (less than 30 degrees versus 30-60 degrees) and has many (many versus absent) longitudinal creases compared to PHK29. The anther color of PHP38 is red whereas it is yellow for PHK29. PHP38 has 16 kernel rows and a light green fresh husk color whereas PHK29 has 14 kernel rows and a dark green fresh husk color. The cob color of PHP38 is white compared to red for PHK29.

PHP38 yields less, has similar grain harvest moisture, and higher test weight than PHK29. PHP38 is a shorter inbred with lower ear placement than PHK29. PHP38 has a significantly better early seedling vigor and resistance to stalk lodging than PHK29.

## VARIETY DESCRIPTION INFORMATION

9000250

INBRED = PHP38

Type: Dent

Region Best Adapted: Most Regions

A. Maturity: Zone : 0

Heat Unit Shed: 1480

Heat Unit Silk: 1500

No. Reps: 64

$$\text{HEAT UNITS} = \frac{[\text{Max.Temp. } (<86^{\circ}\text{F.}) + \text{Min. Temp } (>50^{\circ}\text{F.})]*}{2} - 50$$

\* If maximum is greater than 86 degrees fahrenheit, then 86 is used and if minimum is less than 50, then 50 is used. Heat units accumulated daily and can not be less than 0.

## B. Plant Characteristics:

Plant height (to tassel tip): 225 cm

Length of top ear internode: 12 cm

Number of ears per stalk: Single

Ear height (to base of top ear): 82 cm

Number of tillers: None

Cytoplasm type: Normal

## C. Leaf:

Color: (B14) Dark Green

Angle from Stalk: &lt; 30 degrees

Marginal Waves: (WF9) Few

Number of Leaves (mature plants): 20

Sheath Pubescence: (W22) Light

Longitudinal Creases: (PA11) Many

Length (Ear node leaf): 80 cm

Width (widest point, ear node leaf): 9 cm

- Page Two -

## D. Tassel:

Number lateral branches: 8  
Branch Angle from central spike: > 45 degrees  
Pollen Shed: Medium based on Pollen Yield Test  
(98% of experiment means)  
Peduncle Length (top leaf to basal branches): 22 cm  
Anther Color: Red  
Glume Color: Green

## E. Ear (Husked Ear Data Except When Stated Otherwise):

Length: 16 cm  
Weight: 121 gm  
Mid-point Diameter: 45 mm  
Silk Color: Green  
Husk Extension (Harvest stage): Very Long (> 10 cm)  
Husk Leaf: Medium (8-15 cm)  
Taper of Ear: Average  
Position of Shank (dry husks): Pendent  
Kernel Rows: Straight, Distinct Number = 16  
Husk Color (fresh): Light Green  
Husk Color (dry): Buff  
Shank Length: 13 cm  
Shank (No. of internodes): 8

## F. Kernel (Dried):

Size (from ear mid-point)  
Length: 11 mm  
Width: 8 mm  
Thick: 6 mm  
Shape Grade (% rounds): 40-60 (59% medium round based on Parent  
Test Data)  
Pericarp Color: Colorless  
Aleurone Color: Homozygous Yellow  
Endosperm Color: Yellow  
Endosperm Type: Normal Starch  
Gm Wt/100 Seeds (unsized): 30 gm

## G. Cob:

Diameter at mid-point: 29 mm  
Strength: Strong  
Color: White



- Page Three -

## H. Diseases:

Corn Lethal Necrosis (MCMV=Maize Chlorotic Mottle Virus and MDMV=Maize Dwarf Mosaic Virus): Resistant  
 Maize Dwarf Mosaic Complex (MDMV & MCDV=Maize Dwarf Virus): Susceptible  
 Anthracnose Stalk Rot (C. graminicola): Resistant  
 S. Leaf Blight (B. maydis): Resistant  
 N. Leaf Blight (E. turcicum): Intermediate  
 Carbonum Leaf Blight (H. carbonum): Resistant  
 Eye Spot (K. zeae): Intermediate  
 Gray Leaf Spot (C. zeae): Susceptible  
 Stewart's Wilt (E. stewartii): Resistant  
 Goss's Wilt (C. nebraskense): Resistant  
 Common Smut (U. maydis): Intermediate  
 Head Smut (S. reiliana): Highly Resistant  
 Fusarium Ear Mold (F. moniliforme): Resistant

## I. Insects:

European Corn Borer-1 Leaf Damage (Pre-flowering): Susceptible  
 European Corn Borer-2 (Post-flowering): Intermediate

The above descriptions are based on a scale of 1-9, 1 being highly susceptible, 9 being highly resistant.

S (Susceptible): Would generally represent a score of 1-3.  
 I (Intermediate): Would generally represent a score of 4-5.  
 R (Resistant): Would generally represent a score of 6-7.  
 H (Highly Resistant): Would generally represent a score of 8-9. Highly resistant does not imply the inbred is immune.

## J. Variety Most Closely Resembling:

Character	Inbred
Maturity	PHK29
Usage	<del>PHG39</del>

PHK29 (PVP Certificate No. 8700214) and PHG39 (PVP Certificate No. 8300115) are Pioneer Hi-Bred International, Inc. proprietary inbreds.

Data for Items B, C, D, E, F, and G is based primarily on a maximum of two reps from Johnston, Iowa grown in 1988, plus description information from the maintaining station.

## CLARIFICATION OF DATA IN EXHIBITS C AND D

Please note the data presented in Exhibit C, "Objective Description of Variety," is data collected primarily at Johnston, Iowa plus description information from the maintaining station. The data in Exhibit D, "Additional Description of Variety," is data from comparisons of inbreds or hybrids grown in the same tests in the adapted growing area of PHP38.

# DEFINITIONS

In the description and examples, a number of terms are used herein. In order to provide a clear and consistent understanding of the specification and claims, including the scope to be given such terms, the following definitions are provided:

**BAR PLT = BARREN PLANTS.** This is the percent of plants per plot that were not barren (lack ears).

**BRT STK = BRITTLE STALKS.** This is a measure of the stalk breakage near the time of pollination, and is an indication of whether a hybrid or inbred would snap or break near the time of flowering under severe winds. Data are presented as percentage of plants that did not snap.

**BU ACR = YIELD (BUSHEL/ACRE).** Actual yield of the grain at harvest adjusted to 15.5% moisture. ABS is in absolute terms and % MN is percent of the mean for the experiments in which the hybrid or inbred was grown.

**DRP EAR = DROPPED EARS.** This is a measure of the number of dropped ears per plot and represents the percentage of plants that did not drop ears prior to harvest.

**EAR HT = EAR HEIGHT.** The ear height is a measure from the ground to the top developed ear node attachment and is measured in centimeters.

**EST CNT = EARLY STAND COUNT.** This is a measure of the stand establishment in the spring and represents the number of plants that emerge on a per plot basis for the hybrid or inbred.

**GDU SHD = GDU TO SHED.** The number of growing degree units (GDUs) or heat units required for an inbred line or hybrid to have approximately 50 percent of the plants shedding pollen and is measured from the time of planting. Growing degree units are calculated by the Barger Method, where the heat units for a 24-hour period are:

$$\text{GDU} = \frac{(\text{Max. temp.} + \text{Min. temp.})}{2} - 50$$

The highest maximum temperature used is 86°F and the lowest minimum temperature used is 50°F. For each inbred or hybrid it takes a certain number of GDUs to reach various stages of plant development.

GDU SLK = GDU TO SILK. The number of growing degree units required for an inbred line or hybrid to have approximately 50 percent of the plants with silk emergence from time of planting. Growing degree units are calculated by the Barger Method as given in GDU SHD definition.

GRN QUL = QUAL. = GRAIN QUALITY. This is a 1 to 9 rating for the general quality of the shelled grain as it is harvested based on such factors as the color of the harvested grain, any mold on the grain, and any cracked grain. High scores indicate good grain quality and low scores indicate poor grain quality.

MST = HARVEST MOISTURE. The moisture is the actual percentage moisture of the grain at harvest.

PLT HT = PLANT HEIGHT. This is a measure of the height of the plant from the ground to the tip of the tassel in centimeters.

RT LDG = ROOT LODGING. Root lodging is the percentage of plants that do not root lodge; plants that lean from the vertical axis at an approximately 30° angle or greater would be counted as root lodged.

SDG VGR = SEEDLING VIGOR. This is the visual rating (1 to 9) of the amount of vegetative growth after emergence at the seedling stage (approximately five leaves). A higher score indicates better vigor and a low score indicates poorer vigor.

STA GRN = STAY GREEN. Stay green is the measure of plant health near the time of black layer formation (physiological maturity). A high score indicates better late-season plant health.

STK LDG = STALK LODGING. This is the percentage of plants that did not stalk lodge (stalk breakage) as measured by either natural lodging or pushing the stalks and determining the percentage of plants that break below the ear.

TST WT = TEST WEIGHT UNADJUSTED. The measure of weight of the grain in pounds for a given volume (bushel).

14D. EXHIBIT D. ADDITIONAL DESCRIPTION OF PHP38.  
INER PER SE YIELD TEST COMPARISON OF PHP38 AND PHP29 EVALUATED OVER  
THREE YEARS.

AREA DEFINITION - DIVISION: PB		VARIETY #1 - PHP38 VARIETY #2 - PHP29		USER NAME: MEYERM		AREA NAME: PHP38B		DESCRIPTION: PHP38 PVP 7/90 * = 10% SIG + = 5% SIG # = 1% SIG								
YEAR	VAR #	BU ACR ABS	BU ACR %WV	MST ABS	BAR PLT HT ABS	PLT HT ABS	EAR HT ABS	SDG VGR ABS	EST CNT ABS	DRP EAR ABS	GDU SHD ABS	GDU SLK ABS	TST WTA ABS	GRN QUL ABS	STA GRN ABS	STK LDG ABS
87	1	61.6	86	20.2	92.9	176.3	73.9	7.2	45.6	99.8	1462	1487	60.2	6.9	6.7	97.7
	2	88.2	122	19.7	94.0	195.8	91.4	6.0	45.3	100.0	1493	1519	60.5	7.0	7.4	92.5
	LOCS	6	6	6	7	4	4	6	15	4	12	9	6	6	9	6
	PROB	.038+	.037+	.394	.764	.057*	.001#	.135	.757	.391	.001#	.029+	.210	.770	.129	.060*
88	1	41.6	92	20.2	87.8	182.6	69.8	7.0	39.3	99.9	1502	1522	57.8	7.4	6.4	99.6
	2	52.8	118	20.9	85.0	186.4	73.4	6.1	37.7	100.0	1530	1571	57.5	7.7	6.7	94.7
	LOCS	15	15	15	18	13	13	22	30	8	28	25	15	10	17	10
	PROB	.006#	.009#	.266	.309	.483	.660	.014+	.057*	.351	.000#	.000#	.449	.475	.391	.131
89	1	76.3	111	24.3	89.8	207.0	80.0	6.4	37.3	99.5	1435	1454	57.1	6.7	7.2	97.3
	2	85.5	124	24.3	91.1	215.4	86.9	5.3	35.2	99.6	1457	1490	56.0	7.0	6.5	90.4
	LOCS	41	41	43	10	26	25	53	67	25	54	36	41	36	24	32
	PROB	.004#	.006#	.836	.724	.006#	.014+	.000#	.009#	.471	.000#	.000#	.000#	.122	.087*	.004#
TOTAL SUM	1	66.5	104	22.9	89.4	196.8	76.2	6.6	38.9	99.6	1458	1483	57.5	6.8	6.9	97.8
	2	77.8	122	23.1	88.6	204.7	82.6	5.6	37.2	99.8	1483	1522	56.8	7.2	6.8	91.5
	LOCS	62	62	64	35	43	42	81	112	37	94	70	62	52	50	48
	DIFF	11.4	18	0.2	0.8	7.9	6.4	1.1	1.7	0.1	25	39	0.7	0.3	0.1	6.3
	PROB	.000#	.000#	.520	.658	.002#	.003#	.000#	.001#	.307	.000#	.000#	.000#	.079*	.654	.000#
YEAR	VAR #	BU ACR ABS	BU ACR %WV	MST ABS	BAR PLT HT ABS	PLT HT ABS	EAR HT ABS	SDG VGR ABS	EST CNT ABS	DRP EAR ABS	GDU SHD ABS	GDU SLK ABS	TST WTA ABS	GRN QUL ABS	STA GRN ABS	STK LDG ABS

14D. EXHIBIT D. ADDITIONAL DESCRIPTION OF PHP38.  
INERED PER SE YIELD TEST COMPARISON OF PHP38 AND ~~PHP39~~ EVALUATED OVER  
THREE YEARS.

JMS  
7/10/91  
VARIETY #1 - PHP38  
VARIETY #2 - ~~PHP39~~

\* = 10% SIG + = 5% SIG # = 1% SIG

YEAR	VAR #	BU ACR ABS	BU ACR %MN	MST ABS	BAR PLT ABS	BAR PLT HT ABS	EAR HT ABS	SDG VGR ABS	EST CNT ABS	DRP EAR ABS	GUJ SHD ABS	GUJ SLK ABS	TST WTA ABS	GRN QUL ABS	STA GRN ABS	STK LDG ABS
87	1	61.8	87	20.1	92.9	176.3	73.9	7.2	42.7	99.8	1458	1487	60.1	6.9	6.7	97.7
	2	55.0	76	20.9	83.8	200.4	88.6	6.0	44.5	99.7	1550	1565	58.5	7.0	7.5	97.2
	LOCS	6	6	6	7	4	4	6	13	4	9	6	6	6	9	6
	PROB	.170	.096*	.049+	.157	.008#	.036+	.013+	.015+	.816	.000#	.001#	.010+	.794	.111	.674
88	1	44.0	98	20.2	85.9	177.0	70.1	6.9	40.4	99.9	1509	1531	57.7	7.7	6.4	99.6
	2	26.2	54	20.7	66.7	189.0	79.5	6.4	41.2	99.8	1600	1631	56.0	6.7	6.0	98.6
	LOCS	13	13	13	14	11	11	20	27	8	24	19	13	9	15	10
	PROB	.001#	.001#	.323	.012+	.022+	.004#	.254	.343	.622	.000#	.000#	.000#	.022+	.195	.075*
89	1	75.3	114	21.6	89.4	196.3	72.1	6.5	42.0	98.8	1444	1455	57.7	6.6	6.4	97.8
	2	52.2	79	21.8	84.0	209.0	81.5	5.8	43.4	99.5	1503	1526	56.2	7.1	6.6	96.9
	LOCS	21	21	23	9	15	14	22	32	11	34	31	21	17	12	17
	PROB	.000#	.000#	.728	.234	.003#	.002#	.001#	.052*	.177	.000#	.000#	.000#	.294	.524	.326
TOTAL SUM	1	63.1	105	21.0	88.6	186.4	71.6	6.8	41.6	99.4	1469	1484	58.1	7.0	6.5	98.3
	2	44.2	70	21.3	75.9	200.4	81.8	6.1	42.8	99.7	1544	1566	56.5	7.0	6.6	97.5
	LOCS	40	40	42	30	30	29	48	72	23	67	56	40	32	36	33
	DIFF	18.9	34	0.3	12.7	14.0	10.2	0.7	1.2	0.3	75	82	1.6	0.0	0.1	0.8
	PROB	.000#	.000#	.212	.002#	.000#	.000#	.001#	.007#	.279	.000#	.000#	.000#	.971	.588	.092*
YEAR	VAR #	BU ACR ABS	BU ACR %MN	MST ABS	BAR PLT ABS	BAR PLT HT ABS	EAR HT ABS	SDG VGR ABS	EST CNT ABS	DRP EAR ABS	GUJ SHD ABS	GUJ SLK ABS	TST WTA ABS	GRN QUL ABS	STA GRN ABS	STK LDG ABS

14D. EXHIBIT D. ADDITIONAL DESCRIPTION OF PHP38.  
COMPARISON OF PHP38 AND PHP29 CROSSED TO THE SAME INBRED LINE AND THE  
HYBRIDS EVALUATED OVER THREE YEARS.

VARIETY #1 - PHP38 HYBRID  
VARIETY #2 - PHP29 HYBRID

\* = 10% SIG + = 5% SIG # = 1% SIG

YEAR	VAR #	BU ACR ABS	BU ACR %MN	MST ABS	BAR PLT HT ABS	EAR HT ABS	SDG VGR ABS	EST CNT ABS	DRP EAR ABS	CDU SHD ABS	TST WTA ABS	GRN QUL ABS	STA GRN ABS	STK LDG ABS	RT LDG ABS	BRT STK ABS
87	1	185.6	117	16.9	332.2	155.7	7.0	61.5	98.6	1440	60.1	7.8	7.0	97.5	56.1	
	2	179.5	113	16.7	322.6	139.7	7.0	63.5	99.7	1468	60.9	7.8	7.3	97.6	34.4	
	LOCS	3	3	3	2	2	2	2	3	2	3	3	3	3	1	
	PROB	.337	.346	.525	.205	.076*	1.00	.156	.223	.170	.365	.000#	.184	.990		
88	1	119.9	111	17.7	98.4	254.0	101.1	60.8	98.5	1635	56.7	9.0	5.5	96.3		100.0
	2	107.5	100	17.5	98.5	237.5	92.2	65.7	98.6	1690	56.5	9.0	5.0	91.3		100.0
	LOCS	3	3	3	2	2	3	3	3	1	3	3	2	3		1
	PROB	.406	.441	.873	.899	.234	.395	.080*	.940		.805	1.00	.705	.532		
89	1	137.3	105	26.0	243.8					1448	54.9	6.6				
	2	142.6	109	23.0	247.6					1385	54.2	6.3				
	LOCS	4	4	4	2					2	4	4				
	PROB	.655	.640	.004#	.500					.126	.268	.735				
TOTAL SUM	1	146.6	110	20.7	98.4	276.6	128.3	61.1	98.6	1482	57.0	7.7	6.4	96.9	56.1	100.0
	2	143.1	108	19.5	98.5	269.2	115.8	64.8	99.1	1479	56.9	7.6	6.4	94.4	34.4	100.0
	LOCS	10	10	10	6	4	5	5	6	5	10	10	5	6	1	1
	DIFF	3.4	3	1.3	0.1	7.4	12.5	3.7	0.5	3	0.1	0.2	0.0	2.5	21.7	0.0
	PROB	.558	.577	.037+	.899	.146	.035+	.026+	.264	.911	.781	.713	.000#	.481		

9000250

14D. EXHIBIT D. ADDITIONAL DESCRIPTION OF PHP38.  
COMPARISON OF PHP38 AND ~~PHP~~39 CROSSED TO THE SAME INBRED LINE AND THE  
HYBRIDS EVALUTED.

JMS  
7/10/91

VARIETY #1 - PHP38 HYBRID  
VARIETY #2 - ~~PHP~~39 HYBRID

\* = 10% SIG + = 5% SIG # = 1% SIG

YEAR	VAR #	BU ACR ABS	BU ACR %MN	MST ABS	PLT HT ABS	GDU SHD ABS	TST WTA ABS	GRN QUL ABS	STA GRN ABS
89	1	162.2	101	24.0	268.7	1418	55.7	7.3	3.8
	2	167.9	106	24.1	274.3	1435	55.5	7.5	4.3
	LOCS	11	11	11	4	4	11	11	4
	PROB	.506	.410	.765	.215	.529	.529	.659	.769
TOTAL SUM	1	162.2	101	24.0	268.7	1418	55.7	7.3	3.8
	2	167.9	106	24.1	274.3	1435	55.5	7.5	4.3
	LOCS	11	11	11	4	4	11	11	4
	DIFF	5.7	4	0.2	5.6	17	0.2	0.2	0.5
	PROB	.506	.410	.765	.215	.529	.529	.659	.769
YEAR	VAR #	BU ACR ABS	BU ACR %MN	MST ABS	PLT HT ABS	GDU SHD ABS	TST WTA ABS	GRN QUL ABS	STA GRN ABS



14E. EXHIBIT E. Statement of the Basis of Applicant's Ownership

Pioneer Hi-Bred International, Inc., Des Moines, Iowa, is the employer of the plant breeders involved in the development and evaluation of PHP38. Pioneer Hi-Bred International, Inc. has the sole rights and ownership of PHP38.